# AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

| 1. CONTRACT ID CODE | PAGE OF PAGES |
| --- | --- |
| | 1     7 |

| 2. AMENDMENT/MODIFICATION NO. | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO. | 5. PROJECT NO. *(If applicable)* |
| --- | --- | --- | --- |
| 0001 | MAY 12, 2000 | | |

**6. ISSUED BY**     CODE _____

CONTRACTING OFFICER
NAVAL RESEARCH LABORATORY
ATTN: CODE 3220.DL
WASHINGTON DC 20375-5326

**7. ADMINISTERED BY** *(If other than Item 6)*     CODE _____

**8. NAME AND ADDRESS OF CONTRACTOR** *(No., street, country, State and ZIP Code)*

ALL OFFERORS

CODE _____ FACILITY CODE _____

| (✓) | |
| --- | --- |
| | **9A. AMENDMENT OF SOLICITATION NO.** |
| X | N00173-00-R-DL01 |
| | **9B. DATED** *(SEE ITEM 11)*    MAY 2, 2000 |
| | **10A. MODIFICATION OF CONTRACT/ORDER NO.** |
| | **10B. DATED** *(SEE ITEM 13)* |

## 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____2_____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer x submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

**12. ACCOUNTING AND APPROPRIATION DATA** *(If required)*

## 13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| (✓) | |
| --- | --- |
| | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103 (b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| | D. OTHER *(Specify type of modification and authority)* |

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

**14. DESCRIPTION OF AMENDMENT/MODIFICATION** *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Questions should be directed to Dian Lockamy, Contract Specialist, 202-767-3782.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| 15A. NAME AND TITLE OF SIGNER *(Type or print)* | 16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)* | |
| --- | --- | --- |
| **15B. CONTRACTOR/OFFEROR** <br><br> _____ <br> *(Signature of person authorized to sign)* | **15C. DATE SIGNED** | **16B. UNITED STATES OF AMERICA** <br> BY _____ <br> *(Signature of Contracting Officer)* |
| | | **16C. DATE SIGNED** |

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**The purpose of this amendment is to answer questions received from a prospective offeror.**

**Statement of Work**

1. **Section 1.2, page 1.** The SOW states that the original subsystems have operated over 22 years. In order for us to prepare a valid proposal, we require some baseline information on the machine. Please identify:

   - **Q.** The age and date of install for the TAFS

     *A. [ All of the CTS TAFS hardware was originally installed in 1977, which means it has been in operation in the CTS Facility for 23 years. ]*

   - **Q.** The Carco model number of the TAFS (e.g. model S450R)

     *A. [ CARCO Electronics Model # S-458R-3 ]*

   - **Q.** The Carco Control System model number (e.g. MADES, DR3200, etc.)

     *A. [ S-458R-3 Parallel Digital Control (no specific Control System Model Number). ]*

   - The configuration of the machine

     - **Q**. Number of actuators / axis

       *A. [ 3 Axies (yaw, pitch & roll) with a total of 5 actuators (2 for yaw, 2 for pitch & 1 for roll) ]*

     - **Q**. Number and model numbers of the servo valves on each actuator

       *A. [ All servo valves – Manufacturer: Moog Controls Division, Part Number: A076-150 ]*
       *[ Yaw Axis – 2 servo valves (1 per actuator) ]*
       *[ Pitch Axis – 2 servo valves (1 per actuator) ]*
       *[ Roll Axis – 2 servo valves (2 per actuator) ]*

     - **Q**. Number of pressure transducers / axis

       *A. [ Yaw Axis – 1 differential pressure transducer ]*
       *[ Pitch Axis – 1 differential pressure transducer ]*
       *[ Roll Axis – 1 differential pressure transducer ]*

- **Q**. The method of actuation for each axis, e.g., direct drive hydraulic actuator, gear drive hydraulic motor, etc.

    **A.** *[ Each axis is of the direct drive hydraulic type. ]*

- **Q**. The type of position sensors for each axis, e.g, potentiometer, resolver, Inductosyn, etc.

    **A.** *[ Analog mode: precision analog potentiometers & analog tachometers. Digital mode: optical position encoders & analog tachometers. ]*

2. **Q. Section 2, page 1.** The SOW states "The Replacement CTS Flight-Table Control System will significantly enhance the CTS facility's reliability." What kind of reliability problems has NRL encountered with the existing TAFS? Have these problems been related to the control system, or are they mechanical/hydraulic in nature? Can a maintenance history for the existing TAFS be supplied?

    **A.** *[ All of the current problems are related to the age of the existing control system. A maintenance history cannot be provided. ]*

3. **Q. Section 4.2, <u>Task 2: Preliminary System Acceptance Test at Contractor's Site</u>, page 5.** What is the intent of the acceptance testing at the contractor's site? Without the TAFS, it is difficult to characterize the performance of the control system other than by functional checkout.

    **A.** *[ The intent is to verify the proper operation of the control system before the existing CTS TAFS is dismantled, which will also minimize the downtime. It will also allow a check-out of the software control interface prior to installation at NRL. ]*

4. **Q. Section 4.3, <u>Task 3: Remove Unnecessary Electronic Components from Existing CTS Flight Table System</u>, page 5.** The SOW states that all existing wiring shall be completely removed (*and replaced with new wiring*). Are there any special wiring runs or connectors, such as high frequency video or RF that we must replace?

    **A.** *[ No, there are not. ]*

5. **Q. Section 5.1, <u>Optional Task 1: Refurbishment of Existing TAFS System</u>, page 5.** Again, as with questions 1 and 2 we require some baseline information on the machine configuration and maintenance history to submit a valid proposal. We also request any information on the existing hydraulic power supply (power rating, fluid capacity, filtration capability) that is available.

*A.* *[ Please see the answers to questions 1 & 2 in this section.  This optional task will be required to deal with important deficiencies discovered under Task 1 (unknown problems). ]*

**Performance Specification/Description of the Replacement CTS Flight-Table Control System**

1. **Q. Section 1.2.4, Graphical User-Interface (GUI), page 3 and Table 5, page 13.** You specify the manual control of the NCS be through a GUI program running on Microsoft WINDOWS 98.  You also list in table 5 all the requirements for the GUI monitoring features.  Our COTS control system uses a local touch video screen that contains all the features of the GUI defined in section 1.2.5 and table 5.  It does not use a Microsoft WINDOWS 98 operating system.  Is this configuration acceptable?

   *A.* *[ Yes, this configuration is acceptable ONLY if it meets the following conditions: (a) configuration files for the initial set-up of the control system must be Microsoft WINDOWS®98 file compatible and (b) the local and remote GUIs must 'look and feel' the same (button location, button function, button color, feedback display position, feedback display color, etc) ]*

2. **Q. Section 1.2.5, SCRAMNet Interface, page 3.** You specify a "…VME SCRAMNet interface adapter…" Our COTS control system uses an ISA bus architecture instead of the VME bus architecture.  As such, we will supply an ISA SCRAMNet interface adapter.  Is this acceptable?

   *A.* *[ ISA is not acceptable.  ISA has only 16-bit data bus, this specification requires 32-bit data bus to support the Real-Time Network (RTN) Communications protocol and SCRAMNet hardware. ]*

3. **Q. Section 1.2.5, SCRAMNet Interface, page 3.** You specify "An additional auxiliary processor shall handle the transfer of data between the VME SCRAMNet interface board and the NCS digital memory."   Our COTS control system does not require an auxiliary processor to transfer the data, it is handled through the control system supervisor processor.  Is this acceptable?

   A. *[ No, the auxiliary processor is required to process all SCRAMNet communications with the RTN protocol.  Note that NRL may choose to modify the RTN communications protocol in the future, and by running the protocols on an auxiliary processor the timing and operations of the control system processor is not affected. ]*

4. **Q. Section 1.2.6, Remote GUI, page 4.** You specify the Contractor shall supply the interface hardware for the NRL-supplied PC computer for the remote interface.  The

PC utilizes the Microsoft WINDOWS 98 operating system.  We propose constructing a remote GUI based using an industry standard graphical interface software package (e.g., LabView).  This interface would operate on your PC and contain all the features defined in section 1.2.4 and table 5.  We would supply the GUI source code and all necessary hardware for full system remote operation.  Is this configuration acceptable?

*A.  [ See the answer to question 1 in this section.  Yes, this configuration is acceptable if it meets the following conditions: (a) the remote GUI must run on a PC with Microsoft WINDOWS®98 as its operating system and (b) the remote and local GUIs must 'look and feel' the same (button location, button function, button color, feedback display position, feedback display color, etc) ]*

5. **Q. 1.2.8 Control Capability page 4**. You specify "the NCS hardware shall include manual knobs on the NCS front panel to allow manual operator control of each axes".  We propose supplying a manual "joy stick" controller with "spring-loaded" centering that would generate roll, yaw and pitch rate commands.  The commands would be scaled appropriately for safe and desirable operation.  Is this configuration acceptable?

   *A.  [ No, this is not acceptable. ]*

6. **Q. Section 1.2.9 Feedback Sensor Pick-off Assemblies, page 4.** You specify that the NCS shall include position/rate feedback, differential pressure sensors, and axis-motion limit switches.  Are these sensors already included on the NRL TAFS or does the contractor have to supply them?

   *A.  [ The Contractor shall provide ALL of the required sensors based on the design of their control system that meets the listed specifications.  All of the existing sensors are to be removed by the Contractor prior to the installation of the NCS. ]*

7. **Q. Section 2.1.10, System Diagnostics, page 5.**  You specify that diagnostic software shall be provided to allow "…system closed-loop data collection for real-time Bode analysis of dynamic system closed-loop responses."  Our COTS control system includes a real time data acquisition system for each axis that interfaces to a user-supplied dynamic signal (FFT) analyzer.  This allows not only measurement of the closed-loop frequency response, but also the frequency response of any filter used in the axis digital servo compensation.  Is this configuration acceptable?

   *A.  [ Yes, it is acceptable only if it provides real-time Bode plots on the local GUI computer screen and allows for the recording of collected data in a Microsoft WINDOWS®98 compatable file format. ]*

8. **Q. Section 2, <u>Performance Section for Existing NRL TAFS System</u>, pag*e 8.***
   You state the existing TAFS system includes optical encoders.  We believe that
   these are Inductosyn transducers.  Please verify if this is true.

   ***A.** [ Please see Section 2 in the "Performance Specification/Description of the
   Replacement CTS Flight-Table Control System" document included in the
   solicitation, which describes the existing CTS TAFS.  Also, please see the answers
   to question 1 in the first section. ]*

9. **Q. Section 4, <u>Performance Specification for the NCS</u>, page 11.**  In table 3
   "Performance Specifications for the New Control System" you specify that the
   internal system update rate be 3.6 kilohertz.  If we can meet or exceed all other
   performance requirements listed in table 3 and also in Table 2 "Performance
   Specification for NRL TAFS System using the New Control System Upgrade", with
   an update rate of 1 kilohertz, is this acceptable?

   ***A.** [ Yes, it is. ]*

10. **Q. Section 5, <u>Performance Specification for SCRAMNet Interface Hardware</u>,
    page 12.**  In table 4 you list not only standard SCRAMNet specifications, but also
    items specific to the user implementation, such as board type and shared-memory
    size.  As mentioned earlier, our COTS controller uses an ISA bus SCRAMNet
    adapter, and also only requires a 4 kbyte shared-memory size.  Are these
    acceptable?  Is there any reason you require the larger shared-memory size?

    A. *[ A 4 Kbytes shared-memory size is not acceptable.  An ISA bus SCRAMNet
    adapter is not acceptable.  The RTN communications protocol requires a 32-bit data
    bus (which is not provided by an ISA bus) and one megabyte shared-memory for
    future protocol enhancements. ]*

**Replacement CTS Flight-Table Control System SCRAMNet Interface Control**

1. The information in this section describes a user specific (re: Carco MADES DR3200)
   implementation to a SCRAMNet interface.  Our COTS controller also has a
   SCRAMNet interface with the same feature set, but has a different implementation.
   A few of these differences are:

   - Our controller is ISA bus based, not VME bus based.

   - We do not require an auxiliary processor to have a SCRAMNet interface.  Our
     supervisor processor handles the communication from the shared-memory to the
     axis processor cards.

- We do not use the VxWorks real time operating system for our controller.

- Our Mode register is implemented with a single 32-bit word for all three axes, not a separate word for each axis.

- Our status register is implemented with a single 32-bit word for all three axes, not a separate word for each axis.

- We do not support the Real-Time Network Communications Protocol.

**Q**. We do implement all of the functions required (plus many more) in a different fashion.  Is this an acceptable alternative?


*A.  [ Exhibit B, "SCRAMNet Interface Control" document outlines the requirements and specifications of the SCRAMNet  interface.  Proposals that meet or exceed this published requirements and specifications receive highest consideration.]*